CLAIMS

1. A track lighting system comprising:

a source providing a relatively high-magnitude low-frequency AC voltage to a pair of power line terminals;

voltage conditioning means connected with the power line terminals and operative to provide a relatively low-magnitude high-frequency AC voltage at a pair of track conductors in a power track, the power track having a receptacle slot operable to receive and hold track lighting units having socket terminals, thereby to permit electrical contact between the socket terminals and the track conductors; and

track lighting units: i) having socket terminals, ii) adapted by way of these socket terminals to be inserted into and held by the power track's receptacle slot, thereby to establish electrical contact between the socket terminals and the track conductors, and iii) adapted to be properly powered by the relatively low-magnitude high-frequency AC voltage.

2. The track lighting system of claim 1 wherein the voltage conditioning means comprises: i) full-bridge rectifier means connected with the power line terminals and operative to provide a DC supply voltage, and ii) half-bridge inverter means powered by this DC supply voltage and operative to provide the relatively low-magnitude high-frequency AC voltage at said pair of track conductors;

whereby the voltage conditioner is operative to convert the large-magnitude low-frequency AC voltage into the relatively low-magnitude high-frequency AC voltage without requiring the use of magnetic power transformer means.

3. The track lighting system of claim 1 wherein said voltage conditioning means comprises: i) rectifier means connected with the power line terminals and operative to provide a DC supply voltage, and ii) inverter means powered by this DC supply voltage and operative to provide at the pair of track conductors said relatively low-magnitude high-frequency AC voltage, this low-magnitude high-frequency voltage consisting of intermittent periodic bursts of relatively high-frequency AC voltage.

4. The track lighting system of claim wherein: i) the high-magnitude low-frequency AC voltage has an RMS magnitude of about 277 Volt and a frequency of about 60 Hz, and ii) the low-magnitude high-frequency AC voltage has an RMS magnitude of about 120 volt and a frequency on the order of 30 kHz.

5. The track lighting system of claim 1 wherein one of the track lighting units comprises: i) an incandescent lamp having lamp terminals, and ii) a high-frequency transformer connected in circuit between the socket terminals and the lamp terminals.

6. A track lighting system characterized by:

being powered from an ordinary electric utility power line having a relatively high-magnitude voltage;

comprising voltage conditioner means connected with the power line and operative to provide at a set of output terminals a relatively low-magnitude voltage, the low-magnitude voltage being of frequency substantially higher than that of the high-magnitude voltage;

a power track means having power track conductors and receptacle slot means, the power track conductors being connected with the output terminals and having receptacle slot means operable to receive and hold a number of track lighting units; and

a track lighting unit: i) having socket terminals, ii) being operable to be received and held by the receptacle slot, thereby providing for electrical connection between the socket terminals and the track conductors, and iii) being operable to be properly powered by the low-magnitude voltage on the track conductors.

7. The track lighting system of claim 6 wherein: i) the track lighting unit comprises an incandescent lamp having lamp terminals, and ii) transformer means connected in circuit between the lamp terminals and the socket terminals.

8. The track lighting system of claim 6 wherein: i) the relatively high-magnitude voltage has an RMS magnitude of about 277 Volt, and ii) the relatively low-magnitude voltage has an RMS magnitude of about 120 Volt.

9. The track lighting system of claim 6 wherein the frequency of the relatively low-magnitude voltage is on the order of 30 kHz.

10. The track lighting system of claim 6 wherein the voltage conditioner means is characterized by comprising: i) full-wave rectifier means connected with the power line terminals and providing DC voltage at a DC output, and ii) half-bridge inverter means connected with the DC output and operative to provide said relatively low-magnitude voltage at said output terminals.

11. A track lighting system characterized by:

being powered from an ordinary electric utility power line having a relatively low-frequency voltage;

having a voltage conditioner means connected with the power line and operative to provide a relatively high-frequency voltage at an output, the high-frequency voltage being of frequency substantially higher than that of the low-frequency voltage;

power track means having track conductors connected with the output, the power track means having receptacle slot means by which to provide access to the track conductors; and

a number of track lighting units, each: i) having socket terminals adapted to connect with the track conductors by way of the receptale slot means, and ii) being operative to be properly powered by said high-frequency voltage.

12. The track lighting system of claim 11 wherein at least one of said track lighting units comprises an incandescent lamp designed for proper operation on a low-magnitude voltage of RMS magnitude substantially lower than that of said high-frequency voltage, the low-magnitude voltage being derived from the high-frequency voltage by way of high-frequency transformer means.

13. The track lighting system of claim 11 wherein the voltage conditioner is characterized by comprising full-bridge rectifier means and half-bridge inverter means.

14. The track lighting system of claim 11 wherein the voltage conditioner means constitutes an integral part of the power track means.

15. The track lighting system of claim 11 wherein: i) the power track means is embodied in a first elongated structure having a cross-section, and ii) the voltage conditioner means is comprised within a second elongated structure having a cross-section not substantially larger than that of the first elongated structure.

16. The track lighting sustem of claim 15 wherein: i) the first and the second elongated structures each has a longitudinal axis, and ii) the two structures are so mounted as to have their longitudinal axes substantially coincide.

17. A track lighting system comprising:

an electric power track means: i) connected with an ordinary electric utility power line, ii) having track conductors, iii) being operative to provide a high-frequency voltage at these track conductors, the frequency of this high-frequency voltage being substantially higher than that of the voltage normally present on the power line, and iv) having receptacle slot means operative to receive and hold track lighting means as well as to permit access to the track conductors; and

a number of track lighting means, each track lighting means: i) having socket terminals, ii) being adapted to be inserted and held by the receptacle slot means, iii) when so held, providing for electrical connection between its socket terminals and the track conductors, and iv) being operative to be properly powered by the high-frequency voltage on the track conductors.

18. The track lighting system of claim 17 wherein at least one of said track lighting means comprises an incandescent lamp designed for proper operation to be powered by a relatively low-magnitude voltage, this low-magnitude voltage: i) having RMS magnitude substantially lower than that of the high-frequency voltage, and ii) being obtained from the high-frequency voltage by way of high-frequency transformer means.

19. In a track lighting system connected with an ordinary electric utility power line and powered by the power line voltage thereon, the power line voltage having an RMS magnitude between about 210 Volt and about 280 Volt, the track lighting system having power track means with track conductors, the improvement comprising:

voltage conditioner means connected with the power line and operative to provide at the track conductors a voltage of RMS magnitude between about 105 Volt and about 140 Volt, thereby to permit the operation by direct connection with these track conductors of incandescent lamp means requiring for their proper operation to be powered by a voltage of RMS magnitude between about 105 Volt and about 140 Volt;

the voltage conditioner being characterized by being operative to perform the indicated voltage magnitude-reduction without having to use a power transformer therefor, yet drawing power from the power line with a power factor higher than 67%.